



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Hemorrhage Control and Resuscitation Evaluation of Extremity Tourniquets

Policy decisions implemented in 2005 to broaden tourniquet use by US military personnel in tactical combat casualty care have led to a dramatic reduction in the number of deaths attributed to extremity hemorrhage in the last decade. Currently, several extremity tourniquets are on the market, and rigorous, independent testing is imperative to ensure that the US Warfighter is equipped with the most effective, reliable, and operationally sound tourniquet designs. Researchers at the NAMRU-SA, sponsored by the US Army Medical Materiel Development Activity (USAMMDA) and MCSC, recently evaluated thirteen extremity tourniquet designs to examine their performance, safety, and operational characteristics. The tourniquets were first tested for basic physical parameters and to determine their compatibility with the individual first aid kit. The tourniquets also underwent safety and efficacy testing in the hands of non-medical participants using a HapMed instrumented mannequin limbs in simulated field conditions, including limited visibility and soaked with a blood simulant. Performance metrics included application time and contact pressure, as well as end-user feedback. Of the thirteen designs tested, seven tourniquets met all initial performance criteria and will undergo further evaluations using a SynDaver™ Synthetic Human and during self-applications. The data generated in this controlled and repeatable test environment will assist in the selection of the most effective, reliable, and operationally sound tourniquet designs for use in combat casualty care.